GLOBAL DIALOGUE ON NUCLEAR SECURITY PRIORITIES[1]

CHALLENGES AND OPPORTUNITIES FOR STRENGTHENING THE GLOBAL NUCLEAR SECURITY SYSTEM[2]

September 2014

Despite progress in recent years toward the goal of securing all weapons-usable nuclear materials, there is still no effective global system for doing so. There are no common international standards or best practices for nuclear materials security, no governing body with the necessary mandate and the resources to provide sufficient oversight, and no mechanism for holding states accountable for lax security procedures. The agreements, guidelines, and multilateral engagement mechanisms currently in place have numerous gaps and limitations which undermine global security as well as our confidence in the effectiveness of the system. The challenge then is to strengthen the system, to the benefit of each state individually and for all states globally.

The primary responsibility for nuclear security begins with each state. Because any catastrophe involving nuclear material would be global in scope, states with nuclear materials and facilities have a responsibility to secure all those materials and build confidence in the effectiveness of their security. However, all states—even those without nuclear materials—must work to ensure that their territories are not used as safe havens, staging grounds, or transit points for terrorist operations involving stolen nuclear materials.

There is no question that securing nuclear materials is a sovereign responsibility for states with these materials. However, because a failure of nuclear security in any state would have consequences that would reverberate around the globe—with tens, or hundreds of thousands of casualties; with disruptions to markets and commerce; with long-term implications for public health, energy, and the environment; and risks to civil liberties—not to mention the staggering

[1] Through the Global Dialogue on Nuclear Security Priorities, leading government officials, international experts, and nuclear security practitioners engage in a collaborative process to build consensus about ways to strengthen the global nuclear security system at the Nuclear Security Summits and beyond. The Global Dialogue discussions are conducted on a not-for-attribution basis; where individuals and governments are free to use the information obtained during the meeting, but that information should not be attributed to a specific individual or government. For more information: http://www.nti.org/about/projects/global-dialogue-nuclear-security-priorities.

[2] Participants raised whether to use the terms “global” versus “international” and “system” versus “framework.” Terms can be further debated during formal negotiations, however, the group wanted to note the additional options for consideration. For the sake of brevity, this paper uses the phrase “global nuclear security system.”

cost of response, every state has a national interest in how well others execute this responsibility. Because the consequences of a nuclear event will be shared, so too must be the responsibility for preventing one. Likewise, as in Fukushima, a major radiation release in one state can have serious political, economic, and environmental consequences in many other states and can erode the public confidence needed to sustain long-term public support for civilian nuclear technology, in all of its forms.

This paper identifies key elements of the existing nuclear security system, reveals gaps in the existing system, and describes the characteristics of a strengthened global nuclear security system that were developed during the first three meetings of the Global Dialogue.[3]

Objective of Nuclear Security

For the purposes of this paper, the overarching objective of nuclear security is:

> *To ensure that nuclear materials are secure from unauthorized access and theft and that nuclear facilities are secure from sabotage.*

A nuclear security system is effective if it meets this objective.

The Existing System

The current nuclear security system is defined by a number of international conventions and agreements, United Nations Security Council resolutions, International Atomic Energy Agency (IAEA) recommendations and guidance documents, multilateral engagement mechanisms, and the security practices of states. These include:

- The 1980 Convention on the Physical Protection of Nuclear Material (CPPNM) applies, primarily, to protection of nuclear material in international transport.
- The 2005 Amendment to the CPPNM extends the CPPNM's application to protection of nuclear material in domestic use, as well as protection of nuclear facilities against sabotage. The 2005 Amendment is not yet in force.
- The Convention for the Suppression of Acts of Nuclear Terrorism (ICSANT).
- United Nations Security Council Resolution 1540 (UNSCR 1540).
- Various IAEA guidance documents, such as:
    - Fundamental Principles of Physical Protection of Nuclear Material and Nuclear Facilities.
    - INFCIRC/225, Rev. 5, the current version of the IAEA's nuclear security recommendations.

[3] Meetings were held in July 2012 outside Washington, D.C.; October 2012 in Dalfsen, the Netherlands; and in May 2013 in Annecy, France. Rapporteur's Reports summarizing the discussions and results of those meetings are available on the Global Dialogue project page.

    - INFCIRC/153 and 66 (Safeguards Agreements) and their related requirements for the establishment of a State System for Accounting for and Control of Nuclear Material (SSAC).
- Various multilateral, regional, and bilateral agreements and initiatives that address nuclear security (e.g., the G8 Global Partnership Against the Spread of Weapons and Materials of Mass Destruction, the Global Initiative to Combat Nuclear Terrorism, and the Global Threat Reduction Initiative).

These agreements, guidelines, and initiatives, even when combined, do not yet add up to an effective global system for securing all nuclear weapons, weapons-usable nuclear material, and major nuclear facilities worldwide against today's terrorist and criminal threats—let alone those that may arise in the future. The majority of these arrangements are non-binding and both participation and implementation varies widely. In addition, nearly all of the legal agreements and guidelines cover only the 15 percent of weapons-usable nuclear materials in civilian programs.

[Note: See the resource "Nuclear Security Primer: The Existing System," on the Global Dialogue project page for a brief overview of key elements of the existing system, their benefits, and limitations.]

Proposed Characteristics of a Strengthened Global Nuclear Security System[4]

Proposed below are four characteristics of a strengthened global nuclear security system developed during the first three meetings of the Global Dialogue on Nuclear Security Priorities.

1. **All weapons-usable nuclear materials and facilities** should be covered by the system.

The system should cover all nuclear materials and facilities, especially weapons-usable nuclear materials and facilities where sabotage could cause a major radiation release. The 2014 Nuclear Security Summit communiqué reaffirmed the "fundamental responsibility of States ... to maintain at all times effective security of all nuclear and other radioactive materials, including nuclear materials used in nuclear weapons, and nuclear facilities under their control." Military materials are estimated to comprise 85 percent of global stocks of weapons-usable nuclear materials, most of which are located in Russia and the United States. Those materials are not subject to the CPPNM and the 2005 Amendment (which apply only to civilian materials) or to IAEA guidelines. They are also not routinely subject to assurance mechanisms such as best

[4] This section is informed by and draws on ideas from papers commissioned by NTI from Robert Floyd, Roger Howsley, Patricia Lewis, Anita Nilsson, Pavel Podvig, and William Tobey.

practice exchanges, information sharing, and peer review that would be important for building confidence in the effectiveness of their security.

To make real the communiqué's commitment to secure "all materials," states with military materials should commit to secure military materials to the same or higher standards as comparable civilian materials, including through the application of best practices and, at a minimum, to those set out in the IAEA's nuclear security guidelines. States should also think creatively about how to do that in a way that builds confidence in the effectiveness of those materials' security while protecting sensitive information.

For further analysis addressing these issues, see the September 2014 non-paper, "Non-Paper: Building International Confidence in the Security of Military Material," here.

2. All states and facilities with those materials should **adhere to international standards and best practices.**

Effective nuclear security requires the implementation of international standards and guidelines. Employing best practices consistently and globally is a strategy for rapidly and effectively improving nuclear security practices worldwide.

According to generally accepted definitions, a standard is established by authority, custom, or general consent and defines performance requirements, specifications, guidelines, or characteristics. A best practice is a method or technique that has consistently shown results superior to those achieved with other means and that, through experience and research, has proven to reliably lead to a desired result.

Standards are relatively static, usually evolve slowly over time, and often lag behind emerging threats or new technology. Unlike standards, which are agreed upon and adopted by a body or group, best practices develop not by consensus but from the experience of many individuals and groups and are constantly evolving. They are dynamic and can be tailored to a specific set of circumstances and conditions. Although the characteristics of best practices and standards may be different, they are related concepts and play parallel, complementary roles in ensuring security.

The international community has authoritatively established the value of best practices for rapid and effective security improvement. The 2014 Nuclear Security Summit communiqué "encourage[d] States, regulatory bodies, research and technical support organisations, the nuclear industry and other relevant stakeholders, within their respective responsibilities, to . . . share good practices and lessons learned at [the] national, regional and international level."

While the sharing of best practices has helped increase standards of security in many places, more work should be done to expand the sharing and implementation of best practices and to

garner political and financial support for these activities. The World Institute for Nuclear Security (WINS) is the only international organization solely devoted to the development, exchange, and promulgation of nuclear security best practices.[5] WINS offers a series of best practice guides on a wide range of topics and conducts workshops to gather and disseminate best practices. Best practices are transmitted informally through other mechanisms as well, such as workshops or training programs where security professionals gather from around the world, including at regional Centers of Excellence and IAEA Nuclear Security Training and Support Centers, and through peer reviews offered by the IAEA.

For more information on standards and best practices, see the non-paper, "Non-Paper 4: The Strategic Value of Best Practices for Nuclear Security," on the Global Dialogue project page.

3. States should help **build confidence in the effectiveness of their security practices** and take **reassuring actions** to demonstrate that all nuclear materials and facilities are secure.

Nuclear security is a sovereign responsibility, but because the consequences—security, economic, environmental, and societal—of a nuclear catastrophe would reverberate around the globe and shake public confidence in both nuclear industry and governments, all governments and the global public have an equity in how effective other governments are in meeting their security responsibilities. As a result, nuclear security is both a shared and a sovereign responsibility.

One way for states to appropriately discharge their shared responsibility for nuclear security is to take steps to reassure others that they are appropriately and consistently discharging their nuclear security mission. States can do this through activities, information sharing, or other voluntary measures that build the confidence of others (other governments, a designated international organization, the public, etc.) about the effectiveness of nuclear security within a given state. Reassuring actions or confidence-building measures, sometimes called "assurances," do not require a treaty or convention, are not negative security assurances, are not necessarily linked to disarmament, are not verification or inspections, and are not disclosure of locations of nuclear materials or sensitive specifics of security practices. In fact, confidence-building mechanisms are widely used across many industries, including those involving sensitive information (nuclear safety, aviation, shipping, etc.).

Some limited confidence-building mechanisms already exist in the nuclear security field and demonstrate that states can reassure others without disclosing sensitive information. These include IAEA peer review, best practice exchanges, material declarations, publication of annual

[5] To help fill a capacity gap in the nuclear security field and assist with nuclear security implementation, WINS was created to provide an international forum for developing and promulgating best practices to the boards, CEOs, security directors, security practitioners, and regulators who have responsibilities for developing, overseeing, and maintaining nuclear security.

reports on nuclear security or nuclear security regulation, existing reporting obligations through UNSCR 1540 and Article 14.1 of the CPPNM, and training. In addition, there is broad experience through current and past activities related to military material (notably through U.S.-Russia cooperation) that provide lessons on how states can build confidence in the effectiveness of their security without compromising sensitive information.

For more detailed information on this concept, see the discussion paper, "Next Steps on International Assurances," on the Global Dialogue project page.

4. States should work to reduce risk through **minimizing** or, where feasible, **eliminating weapons-usable nuclear materials stocks** and the number of locations where they are found**.**

Today, there is no international obligation to minimize or eliminate holdings of weapons-usable materials, and there is no ready way to track what states are doing in this regard as few states disclose their holdings of these materials. A major international program that is working to phase out the civilian use of highly enriched uranium (HEU) and eliminate HEU holdings has been successful, but 25 countries still have holdings of either HEU or separated plutonium. This is another area where the Nuclear Security Summits have facilitated progress that otherwise may not have taken place. However, more work is needed to address the remaining technical and political challenges to eliminating HEU and expanding the so-far limited conversations on plutonium.

For further analysis addressing issues related to plutonium management, see the September 2014 discussion paper, "Strengthening the Security of Plutonium," here.

Looking Forward

At the 2014 Nuclear Security Summit in The Hague, it was clear that substantial progress has been made to address two of the above characteristics: First, the Summit communiqué recognized the need for a "strengthened and comprehensive nuclear security architecture," consisting of, among other things, "internationally accepted guidance and best practices," and encouraged states to "utilise [IAEA] guidance as appropriate." More importantly, 35 states signed the "Strengthening Nuclear Security Implementation" gift basket, committing them to implement international guidance and best practices and to participate in peer review, thereby recognizing the need not only to develop, but to apply a common set of standards and best practices to their nuclear security regimes. Second, in the Summit communiqué, states agreed to the importance of voluntary measures to show that states have established effective security of their nuclear materials and facilities while protecting sensitive information in order to build national and international confidence in the effectiveness of their nuclear security regimes. In addition, there has been substantial progress toward eliminating the use of HEU in civilian

energy programs, although there continue to be roadblocks, both political and technical, to completing that mission.

Progress has so far been elusive on two issues. First, there have been limited concrete proposals on the concept of comprehensiveness—ensuring that military materials are secured to at least the same or higher standards than comparable civilian material and developing practical proposals for how to build confidence that military material is effectively secured. Second, discussions on the minimization, management, and elimination of plutonium have so far been limited, without consensus on whether plutonium is even a material of concern.

Finally, as the international community nears the end of the Nuclear Security Summit process, with the 2016 Summit assumed to be the final Summit in the series, states must also consider how to sustain an effective regime beyond 2016 as they strive to further strengthen the global nuclear security system.